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ALFALFA (*Medicago sativa*)

[Instructions adapted to Pennsylvania, West Virginia, Maryland, Kentucky, Tennessee, Arkansas, Virginia, and the Southern States, except western Texas.]

Alfalfa requires a deep, fertile, well-drained, heavily limed seed bed, reasonably free from weeds. Inoculation is also necessary. Late summer seeding is recommended. Failure to provide for any one of these essentials usually means failure of the stand.

Description.—Alfalfa is an upright, smooth, perennial, leguminous forage plant. It occupies the same place in western agriculture that cowpeas and red clover fill in the eastern one-third of the United States. Alfalfa is to be preferred to red clover in the eastern sections of the country whenever it can be successfully produced. Pound for pound alfalfa hay is a much better feed than clover, and three to five good hay crops may usually be procured each season, depending upon the latitude. Good cowpea hay is almost equal in feeding value to alfalfa, but the number of crops of alfalfa produced in one season makes the total yield per acre two or three times that of cowpeas, besides being more easily cured. Alfalfa lends itself readily for soiling purposes, as it quickly recovers and resumes its growth after cutting. It is better adapted for this purpose than it is for pasture. Since it is perennial it will last a number of years unless crowded out by weeds or otherwise destroyed.

Soil requirements.—A deep, fertile, well-drained, nonacid soil, reasonably free from weeds, is required. Alfalfa will not succeed on a poorly drained soil or one low in fertility or deficient in lime. With the possible exception of the limestone regions, all soils in the region specified may safely be considered to require liming for alfalfa. Even in the limestone regions liming is usually beneficial. At least a ton of lime per acre is generally required, and more than this is often necessary on the heavier soils. Ground unburned limestone is recommended wherever it can be procured at three-fifths the cost of the caustic lime. Nearly double the quantity of the ground unburned limestone is required. Well-rotted barnyard manure is the most satisfactory fertilizer. If this is not available, a liberal application of commercial fertilizer rich in potash and phosphoric acid should be made. The percentage of nitrogen may be low, but some nitrogen should be supplied for the young plants before they become inoculated and are able to secure their supply from the air. A good combination of fertilizer is muriate of potash 75 pounds, acid rock 250 pounds, and nitrate of soda 50 pounds.

Preparation of the soil.—When once started under favorable soil conditions, weeds will likely prove the most dangerous enemy. For this reason it is best to precede the alfalfa for at least one or two years with crops which are either clean cultivated or which themselves choke out the weeds, as, for instance, cowpeas. Then the best method (although it loses the use of the land one season) is to heavily manure the land in the spring, plow, lime, and harrow frequently until seeding time in late summer to prevent weed growth. A fair supply of humus is often as important for alfalfa as a liberal supply of the different fertilizing constituents. For this reason, in the absence of an abundance of good stable manure, it is desirable to plow under some green-manure crop such as red or crimson clover, rye, or cowpeas, the kind of crop depending on the locality. Cowpeas can not well be plowed under in time for planting alfalfa in the same season, as the vines do not have sufficient time to decay before time for planting. They can be plowed under the autumn previous and the land sown to crimson clover or rye that fall or to cowpeas the following spring. If sown again to cowpeas, they should be sown early, mowed, and the stubble disked and repeatedly harrowed to bring the land into the necessary well-settled and finely pulverized condition. Red and crimson clover and rye can be plowed under and the ground harrowed frequently until late summer, when the seeding should take place. The lime should be added some time before seeding the alfalfa in order that it may become thoroughly incorporated into the soil. Where land is exceptionally fertile and in good tilth alfalfa may follow any clean-culture crop, such as early potatoes or small-grain crops, provided these can be harvested in time to allow sufficient time for thoroughly preparing the seed bed. In this way it will not be necessary to lose the use of the land for an entire season in order to get it into proper condition.

Seed bed.—The soil should be well settled and finely pulverized on top. If possible, at least six weeks should intervene between the time of plowing and that of seeding. Frequent harrowings should be given to settle the ground, produce the necessary fine tilth, and destroy the weed seedlings as they start.

Inoculation.—Inoculation with nitrogen-fixing bacteria is essential unless the soil is known to be naturally supplied with these germs. This may be accomplished either by the use of artificial cultures or with soil from an old alfalfa field. If the artificial culture is used, the seed should be inoculated shortly before planting. If any of the liquid remains, it may be sprinkled on loose dirt and scattered at the time of seeding. If soil from an old alfalfa field is used instead of an artificial culture, it is essential that the soil be taken from around plants well supplied with tubercles. The soil should be broadcasted at the rate of 250 to 500 pounds per acre and harrowed in immediately. The spreading should take place on a cloudy day or in the evening, as the sun's rays are destructive to the germs. Care should be taken to avoid introducing noxious weeds and fungous diseases. Soil from the roots of sweet clover plants will also inoculate alfalfa. The soil transfer method is much more certain than the pure culture method but it involves more labor and there is liability of introducing weeds or dangerous plant diseases.

Seeding.—The seed should be sown without a nurse crop at the rate of 20 to 30 pounds per acre. It may be drilled or sown broadcast and covered lightly with a smoothing harrow. A much more even stand can be secured by seeding one half of the seed north and south and the other half east and west. Spring seeding is sometimes successful, but the weeds of midsummer are very likely to destroy the stand. Much better results can usually be secured by seeding in late summer or early autumn as soon as the danger from weeds that season is past (August 15 in the latitude of Washington, D. C.). This gives plenty of time for the plants to make sufficient growth before cold weather to pass through the winter safely.

Treatment of the stand.—In the Southern States, if sown in the late summer or early autumn, one light clipping may be made if the growth is as much as 12 or 15 inches high. The plants should have from 6 to 10 inches of growth when they go into the winter. If the alfalfa goes through the winter successfully, the first cutting of hay may usually be secured in May, or earlier in the South. The hay should be cut when the plants are just coming into blossom unless the weeds threaten to choke them out before this stage is reached. The early cuttings should not be mowed low, as the alfalfa plants will not start so quickly and are more likely to be choked out by the weeds. If the first cutting should be light, as usually is the case if the seed is sown in the spring, it may be left on the land as a mulch. If heavy enough to smother the alfalfa plants, it should be removed. Under no circumstances should the field be pastured during the first two years, and even an old field should be pastured sparingly. If green feed is desired, soiling is the best practice.

Need of experimenting.—In most parts of the section specified alfalfa growing is still in the experimental stage. The data at hand indicate that there is, perhaps, no other crop so rigid in its requirements as to soil and treatment. Failure to provide anyone of the indicated requirements usually means a failure. For this reason one's first attempts should be limited to a comparatively small area until he is thoroughly familiar with the requirements of this crop.

For more detailed information, see Farmers' Bulletin No. 339, entitled "Alfalfa."

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